

**A KEY TO THE SPECIES OF CREMASTOCHEILINI
OF NORTH AMERICA AND MEXICO
(COLEOPTERA, SCARABAEIDAE).**

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At the present time there is no key available to the species of the tribe Cremastocheilini which includes the species from Casey (1915) to date, while no recent key is primarily designed for ease of identification. Horn's key (1879 and 1885) is generally good but it is, of course, incomplete, and subsequent collecting has shown the need for modification of certain of his characters. Casey's key was descriptive in nature, not giving comparative characters only, and giving only textual clues to relationships. Cazier has recently (1939 and 1940) given careful consideration to the genera, but unfortunately never published a key to the species. In view of these circumstances it is believed that the following key will be useful.

Although a few changes have been made in the status of names, these changes have already been suggested in recent literature or are changes standing in the collection of the California Academy of Sciences. I have made one change in the application of a name, that of *cribripennis* Casey, to include the entire southern race of *Cremastocheilus armatus* Walker. The only modification of moment that this requires in the Casey description is to reduce the value of the medially carinate clypeus. In the few specimens of the southern California population I have available this character appears to be variable.

Several of the Casey species, while not definitely placed in synonymy due to the present impossibility of checking his types, are included with more definitely identifiable species. Otherwise the synonymy is as adopted in Leng's Catalogue and subsequent literature.

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1.¹ Pronotum with anterior angles entire, normal, not at all delimited 2

¹ Parts of the key which define the genera and subgenera are modified from the generic revision of Cazier; the remainder is either modified from Horn, Casey, or original.

- Pronotum with an excavation or sinus medially delimiting each anterior angle *Cremastocheilus*—5
- 2. (1) Scape with median dorsal surface concave; tarsal constrictions not visible, segments overlapping distally 3
- Scape with this surface flat or convex; tarsal constrictions visible, segments not overlapping distally *Genuchinus*—4

Lissomelas

- 3. (2) Tarsi sculptured with longitudinal carinae; anterior margin of clypeus acute, beneath with a deep median impression; Ariz., Mex. *Lissomelas flohri* Bates

Psilocnemis

- Tarsi smooth, not carinate; anterior margin of clypeus not acute, prolonged beneath as a wide smooth flat plate, not medially depressed; Md. to N. C.
Psilocnemis leucosticta Burmeister

Genuchinus

- 4. (2) Prothorax nearly $\frac{1}{2}$ wider than long, without a posterolateral tomentose border; elytra cuneiform, with very elongate variolate foveae discally; Ariz., So. Calif.
G. ineptus Horn
- Prothorax not over $\frac{1}{5}$ wider than long, with a dense tomentose lateral border; elytra parallel or nearly so, with close-set elongate incised annuli discally; Ariz.
G. angustus Casey

Cremastocheilus

- 5. (1) Anterior tarsi with 4th and 5th segments greatly dilated, 4th almost twice size of 3rd; head with lateral carinae over eyes subg. *Macropodina*—6
- Anterior tarsi with 4th and 5th segments not dilated, subequal to 3rd; head without lateral carinae
subg. *Cremastocheilus*—8
- 6. (5) Pronotum rather evenly rounded at sides; pronotal punctuations large, coarse, shallow to deep but not particularly sparse 7
- Pronotum with side margins mostly straight, angulate at apical third; pronotal punctuations shallow, sparse, separated by 2 to 3 times their own widths; Ariz., So. Calif.
C. (M.) puncticollis Cazier
- 7. (6) Size appx. 16.5 by 7.0 mm.; dorsal surface of 4th anterior

tarsal segment subequal to ventral surface; Ariz., Calif.
(= *ampla* Casey, fide Cazier 1940)

C. (M.) planatus LeConte

— Size appx. 13.0 by 5.0 mm.; dorsal surface of 4th anterior tarsal segment much shorter than ventral surface; Ariz.

C. (M.) beameri Cazier

8. (5) Pronotal disc more or less evenly rounded, at most with slight median or lateral depressions and minor modelling 9
- Pronotum marked into approximately equal thirds by two longitudinal depressions or grooves "Trinodia" group—34
9. (8) Mentum with basal notch, obsolescent to deep 10
- Mentum with base entire, rounded or angulate 16
10. (9) Mentum with basal notch deep, subparallel 11
- Mentum with notch shallow acute or rounded, or obsolescent 15
11. (10) Pronotal punctures normally coarse, rather evenly distributed on the disc; pronotum laterally without an impression at middle 12
- Pronotal punctures fine, with disc largely impunctate; pronotum laterally with an impression near middle; Eastern states *C. harrisii* Kirby
12. (11) Anterior angles of pronotum more or less continuous with disc; hind angles laterally continuous with disc, or, if separate, then strongly retracted toward median line 13
- Anterior angles of pronotum separated by a complete transverse groove; hind angles separated by an oblique groove or impression and only slightly retracted; from Rocky Mountains east, Canada to the Gulf *C. castaneae* Knoch
Great Plains and Mississippi Valley
C. c. lecontei Westwood
Northern and Rocky Mountain, Manitoba to Colo.
C. c. pocularis Casey
Southern States (?)² *C. c. brevisetosus* Casey

² Casey describes *brevisetosus* from a specimen he records from Iowa. However, the only specimens before me which agree are from Alabama, and I am led to suspect an erroneous label on the Casey specimen. In the Alabama specimens the setae of the pronotum are exceedingly broad and short and as the specimens are quite fresh, the character is presumably a good one. This appears to me to be the most distinctive race of any I have seen, and if this name is applicable to the southern specimens it apparently represents a valid subspecies. The value of the other two names as

- 13. (12) Hind angles separated from disc and strongly retracted; Great Plains Area 14
- Hind angles more or less continuous with disc at outer margin, not particularly retracted; Ohio Valley and Atlantic Coast, Can. to Ga. *C. canaliculatus* Kirby
- 14. (13) Legs and entire body deep black, Iowa to Texas
C. retractus LeConte
- Legs rufo-piceous; head and body more or less rufo-piceous to brown-black; Kan., Colo. . . . *C. retractus incisus* Casey
- 15. (10) Hind angles considerably retracted; anterior angles prominent and distinct; mentum with basal notch shallow, triangular or rounded and sometimes obsolescent; Mountain States to Atlantic, Mass. to S. C. *C. variolosus* Kirby
- Hind angles feebly retracted; anterior angles more or less continuous; mentum with basal notch small, narrow, subparallel; N. C. to Fla. *C. squamulosus* LeConte
- 16. (9) Posterior angles of prothorax defined by a more or less complete oblique impression or deep groove; hind tarsi long or short 17
- Posterior angles considerably retracted and poorly or not at all defined; hind tarsi usually notably short and strongly compressed 30
- 17. (16) Hind tarsi with 2nd segment usually distinctly longer than wide, but if short, lateral basal depressions marked and carinate at dorsal margin 18
- Hind tarsi with 2nd segment at least nearly as wide as long; lateral depressions slight or absent, never carinate at edges; Calif. (including *C. compressipes* Casey)
C. angularis LeConte
- 18. (17) Hind angles considerably retracted and depressed below plane of pronotal disc; surface shining, often somewhat rufo-piceous 19
- Hind angles continuous with side margin of pronotum, only slightly retracted and depressed; surface opaque or subopaque 20
- 19. (18) Posterior margin of mentum produced and pointed; elytral punctures rather small and well spaced; anterior pronotal angles pointed; Nebr., Mo., Kan.
C. nitens LeConte

weak races of *castaneae* seems questionable to me. A long series from the Rocky Mountains is not easily separable, although in the main, they most closely agree with Casey's *pocularis*.

- Posterior margin of mentum evenly rounded; elytral punctures large, shallow and separated by about own width; anterior pronotal angles notably wide and blunt; Ariz.
C. chapini Cazier
- 20. (18) Front of head rather evenly rounded down into clypeus; anterior pronotal angles usually distinct and oblique in direction 21
- Front of head angulate, often almost carinate, dropping very abruptly to clypeus and giving top of head a definite rather flat and distinct area; anterior angles not or rarely distinct, more longitudinal in direction 24
- 21.³ (20) Upper surface with hairs short, hardly longer than areolae, very sparse or almost absent, particularly on elytra, never conspicuous 22
- Upper surface with conspicuous, rather long hairs; Brit. Col. to Calif. and Nev. *C. armatus* Walker
- 22. (21) Hind tarsi only 2/3 to 3/4 as long as tibiae 23
- Hind tarsi at least within 1 mm. of being as long as tibiae; Coastal from Ore. to middle Calif.
C. armatus maratimus Casey
- 23. (22) Elytral punctures nearly round, shallow; clypeus never more than faintly carinate; Inland ranges from Wash. to Calif., Nev. (including *C. congener* Casey)
C. armatus montanus Casey
- Elytral punctures elongate, deeper; clypeus sometimes definitely carinate at middle; So. Calif.
C. armatus cribripennis Casey
- 24. (20) Legs rufous; body more or less rufous 25
- Legs and body black 26
- 25. (24) Legs rufous, but head and body mostly blackish; size appx. 13.0 by 6.0 mm.; Ariz. *C. mexicanus* Schaum
- Legs, head and body uniform reddish-brown; size appx. 15.0 by 6.0 mm.; Durango, Mex. *C. robinsoni* Cazier
- 26. (24) Pronotum apparently subquadrate, widest at about basal third, with space between apices of hind angles less by about .2 to .35 mm.; elytral setae sparse but usually long and conspicuous, up to 1 mm. in length 27
- Pronotum apparently rounded, widest at or before middle, with space between apices of hind angles less by about .35

³ *C. densicollis* Casey and *obliquus* Casey will probably key out to either *C. armatus maratimus* or *C. a. montanus*.

- to .45 mm.; elytral setae barely demonstrable, never conspicuous 29
27. (26) Clypeus no wider than front between eyes 28
 — Clypeus wider than head across eyes; N. M., Tex.
C. crinitus LeConte
28. (27) Top of head with two rather well-developed foveae antero-laterally; Brit. Col. to Ariz. and N. M.
C. crinitus bifoveatus Van Dyke
 — Top of head nearly flat, not at all or only slightly depressed within the antero-lateral margin; Wash. to western Colo.
C. crinitus pugetanus Casey
29. (26) Head, body and legs without evident bloom; Great Plains and Mississippi Valley, Manitoba to Ill. and N. M. (including *C. knochi gracilipes* Casey and *C. k. areolatus* Casey) *C. knochii* LeConte
 — Head, body and legs with areas of bloom; N. M.
C. pulverulentus Cazier
30. (16) Pronotal width greatest at or slightly behind middle, punctures not coarser at middle and hairs always setiform 31
 — Pronotal width greatest at hind angles, punctures coarser at middle and hairs there more squamiform; Ariz.
C. quadratus Fall
31. (30) Anterior tibiae bidentate 32
 — Anterior tibiae tridentate; So. Calif.
C. westwoodi tridens Casey
32. (31) Posterior tarsi 1/2 or less the length of tibiae 33
 — Posterior tarsi from 1/2 to 3/4 the length of tibiae; So. Calif.
C. westwoodi Horn
33. (32) Anterior tibiae appreciably longer than their width taken twice; So. Calif. *C. schaumii* LeConte
 — Anterior tibiae about twice as long as wide; So. Calif., Ariz.
C. schaumii tibialis Casey

“TRINODIA” group

34. (8) Tarsi 5-segmented 35
 — Tarsi 4-segmented *C. lengi* Cazier
35. (34) Pronotal impressions continuing from base to apex; clypeus not laterally dilated and with a median carina . . . 36
 — Pronotal impressions extending from base to about middle; clypeus laterally dilated and not carinate; Mont. and Nebr. to So. Calif. *C. wheeleri* LeConte

36. (35) Front of head without a transverse impression in front of eyes; pronotum definitely more than half as wide as elytra 37
 — Front of head with a transverse impression in front of eyes; pronotum only barely more than half as wide as elytra; Ariz. *C. constricticollis* Cazier
37. (36) Anterior tibiae slender, subpedunculate basally, the inner margin rather abruptly constricted at about middle; the upper two teeth at about middle, the two thus less approximate 38
 — Anterior tibiae notably broad and compressed, or moderately slender, but not subpedunculate basally, the inner outline continuous and not constricted; if moderately slender, the upper tooth well beyond middle, the teeth not so widely separated 39
- 38.⁴ (37) Smooth and shining; hind angles of prothorax rather short; Nebr. and Colo. to Tex. *C. saucius* LeConte
 — Hairy and subopaque; hind angles twice as long and with a lateral excavation of prothorax just anterior to angle; Ariz. *C. hirsutus* Van Dyke
39. (37) Anterior tibiae moderately slender 40
 — Anterior tibiae as well as femora notably broad and compressed 43
40. (39) Hind pronotal angles acute, projecting posteriorly; length appx. 11.0 mm. 41
 — Hind pronotal angles rather long, slender and everted; length appx. 7.5 mm.; Tex. *C. spinifer* Horn
41. (40) Dorsally shining 42
 — Dorsally opaque; So. Calif., Ariz. *C. opaculus* Horn
42. (41) Clear testaceous; pygidium in part scabriculate; Kan. *C. setosifrons* Casey
 — Black; pygidium concentrically sculptured by short, fine, irregularly incised lines; Tex. *C. quadricollis* Casey
43. (39) Piceous; hind angles of pronotum upturned at outer edge above; head less punctate, front less pilose; Ariz. *C. planipes* Horn
 — Reddish; hind angles flat at outer edge; head much more densely punctate and front more pilose; Ariz. *C. mentalis* Cazier

⁴ *C. excavatus* Cazier, from Durango and Tlalnepantla, Mexico, would probably key to this couplet. No specimen is at present available and the description does not seem to adequately distinguish the species from *C. hirsutus* Van Dyke.